In the Matter of the City of Wichita's Applications
To Operate an Aquifer Storage and Recovery Project
in Harvey and Sedgwick Counties, Kansas

Applications to Appropriate Water
File Nos. 45,567; 45,568; 45,569; 45,570; 45,571; 45,572;
45,573; 45,574; 45,575; 45,576, and 46,081

Findings

1. That on July 3, 2003, the City of Wichita (City) filed Applications, File Nos. 45,567, 45,568, 45,569, 45,570, 45,571, 45,572, 45,573, 45,574, 45,575, and 45,576, proposing the appropriation of water for beneficial use.

2. That these new applications to appropriate water have been filed under the provisions of the Kansas Water Appropriation Act, K.S.A. 82a-701 *et seq*, particularly K.S.A. 2004 Supp. 82a-711, for the purpose of appropriating and diverting high flows from the Little Arkansas River by means of seven proposed diversion wells, withdrawing water along the West bank of the Little Arkansas River in Section 8, Township 23 South, Range 2 West, Harvey County, Kansas, located generally in an area between two and three miles upstream of the U.S. Highway 50 bridge over the Little Arkansas River, to be treated and injected into the Equus Beds Aquifer by means of three wells and three recharge basins as part of an aquifer storage and recovery (ASR) project, located in Sections 12, 23, and 25 in Township 23 South, Range 3 West, Harvey County, Kansas, located generally on a line approximately three miles east of Burrton, from south of U.S. Highway 50 to just over two miles north of the highway, to be later withdrawn by means of the same aquifer storage and recovery wells for municipal purposes.

3. That a bank storage (diversion) well is a well used to divert or withdraw water absorbed by and temporarily stored in the bed and banks of a stream during above-baseflow stage.

4. That aquifer storage and recovery means the artificial recharge, storage and recovery of water and consists of apparatus for diversion, treatment, recharge, storage, extraction and distribution of water.

5. That the City and Equus Beds Groundwater Management District No. 2 (GMD #2) entered into an initial Memorandum of Understanding (M.O.U.), on August 31, 2004, documenting the agreements made between the City and GMD #2, as to the proposed installation and operation of Phase 1 of the aquifer storage and recovery project, a copy of which was subsequently received in the office of the Chief Engineer, Division of Water Resources, Kansas Department of Agriculture (DWR).

6. That the Secretary of the Kansas Department of Agriculture gave notice by publication in the Kansas Register on September 2, 2004, that the Chief Engineer intended to hold a pre-hearing conference on October 7, 2004, in the above mentioned matter.

7. That on September 3, 2004, the Chief Engineer served notice of a pre-hearing conference, to be held on October 7, 2004, in the matter of the applications identified in Paragraph No. 1, of these findings, by mail to the City, GMD #2, all water right owners of record in the office of the Chief Engineer within one (1) mile of the proposed points of diversion, and all other persons with potential or expressed interest in the applications.

8. That the Chief Engineer gave notice, by publication in the Newton Kansan, on September 11, 2004, and in the Hutchinson News on September 20, 2004, of a pre-hearing conference to be held on Thursday, October 7, 2004, in the above mentioned matter.

9. That on October 7, 2004, the Chief Engineer, convened a pre-hearing conference in accordance with notices issued by the Chief Engineer; that it was attended in person by John Peck, legal consultant to the City; David Warren, Director, Water and Sewer Department for the City; David Stous, Burns & McDonnell, engineering consultant to the City; Jerry Blain, Water and Sewer Department for the City; Ronald Neuway, land owner; Mark Jennings, Environmental Scientist, DWR; Jim Bagley, Section Head, Technical Services, Operations and Technical Services, DWR; Dan Riley, Chief Counsel, Kansas Department of Agriculture (KDA); Barbara Hodgson, staff attorney, KDA; and Leland E. Rolfs, staff attorney, KDA, representing the Chief Engineer; and it was attended by telephone by Joe Bergkamp, land owner; Joe Lang, First Assistant City Attorney representing the City; Mike Dealy, Manager, GMD #2; and Bob Seiler, President, GMD #2.

10. That on October 18, 2004, a pre-hearing order was issued by the Chief Engineer, setting forth the following issues to be addressed in the public hearing:

    a. Will the City have legal access to the sites where the proposed wells will be located as required by K.A.R. 5-3-3a?

    b. Will the City be considered to be recharging water into the Equus Beds by the concept of "passive recharge?" --i.e., water which the City could have legally pumped, but did not pump.

    c. Will the proposed project impair existing water rights by causing an unreasonable deterioration of the water quality at any water user's point of diversion beyond a reasonable economic limit?

d. Will the water diverted from the City's proposed diversion wells withdraw surface water from the Little Arkansas River?

e. Will the conditions agreed to in the M.O.U., between the City and GMD #2 adequately protect landowners, in the area being recharged, from damage from the unreasonable raising of the water table?

f. Are downstream water users in the Little Arkansas River going to be protected against impairment caused by diversion of high flows of the river?

g. Will this project impair senior water rights in the Equus Beds Aquifer by adversely affecting the underflow?

11. That on November 18, 2004, the City requested modifications of Applications, File Nos. 45,567, 45,569 and 45,572.

12. That on November 19, 2004, Application, File No. 46,081, was filed in the Office of the Chief Engineer, for use in the ASR project, as described above, and proposing an additional recharge and recovery well at a site where the City had formerly proposed to utilize a recharge basin.

13. That on November 22, 2004, a second pre-hearing order was issued, setting forth the issues to be addressed at the hearing, including those stated in Finding No. 10 above, and further whether the modification of Applications, File Nos. 45,567, 45,569 and 45,572, and the filing of the new Application to Appropriate Water, File No. 46,081, are significant enough to:

a. Change the nature and impact of the proposed project.

b: Necessitate changes to the City's groundwater and accounting model.

c. Affect the substance of GMD #2's recommendations concerning the proposed project, including its M.O.U. with the City; and if so, will GMD #2 modify its recommendations, including its M.O.U. with the City.

d. Cause impairment of water rights with a priority senior to the date these modifications were requested and the new application filed.

e: Prejudicially and unreasonably affect the public interest.

14. That on December 6, 2004, a hearing notice was issued by the Chief Engineer, controlling the proceedings in this matter, setting forth the parties to the hearing and reaffirming the issues to be addressed, as stated in Finding Nos. 10 and 13.

15. That the Chief Engineer served notice of the hearing on the parties of these proceedings (the City and GMD #2), on December 6, 2004, and also published notice of hearing in the Wichita Eagle and Hutchinson News, on December 10, 2004.

16. That under the authority of K.A.R. 5-12-3, a formal public hearing was convened in Hutchinson, Kansas, at the Kansas Cosmosphere, on December 21, 2004, before the Hearing Officer, David L. Pope, Chief Engineer.

17. That the general purpose of the hearing was to consider the City's new Applications to Appropriate Water, File Nos. 45,567; 45,568; 45,569, as modified; 45,570; 45,571; 45,572, as modified; 45,573; 45,574; 45,575; 45,576, as modified; and 46,081, and to allow the parties to formally address the questions cited in Finding Nos. 10 and 13, above, and to generally inform the Chief Engineer about the proposed project, including how surface water will be withdrawn from the Little Arkansas River, how water will be treated and recharged into the Equus Beds Aquifer, how the accounting system proposed by the City will ensure that it is only withdrawing water that has been recharged, and any terms and conditions that will need to be placed on the permits to prevent impairment and prevent the project from prejudicially and unreasonably affecting the public interest.

18. That both parties presented opening statements, which were followed by the testimony of William J. Gilliland, Permits Unit Head, DWR, who introduced DWR Exhibits A through QQ, which were admitted without objection.

19. That the City presented its case-in-chief, which consisted of a brief overview of the proposed project, response to the issues identified in Finding Nos. 10 and 13, above, a description of the water accounting model and the water accounting records that will be kept by the City, and the testimony of David R. Warren, the City's Director of Water and Sewer; Jeff Klein, Professional Engineer, Burns and McDonald Engineers; Gerald T. Blain, Licensed Professional Engineer for the City, and member of the Board of Directors of GMD #2; Andrew Ziegler, United States Geological Survey; and David Stous, Professional Engineer and Professional Geologist, Burns and McDonald Engineers; that the City requested approval of its proposed applications, described in Finding No. 17, in accordance with the GMD #2 recommendations and the terms of its M.O.U. with the City. GMD #2 was provided with the opportunities to cross-examine these witnesses. Opportunities for re-direct and re-cross examinations were also provided.

20. That GMD #2 presented its case-in-chief, which consisted of its recommendation on the applications, its M.O.U. with the City, and the testimony of Mike Dealy, Manager of GMD #2, Carl Nuzman, consultant for GMD #2, and Bob Seiler, President of the Board of GMD #2; that GMD #2 recommended approval of the proposed applications described in Finding No. 17, in accordance with the GMD #2 recommendations and the terms of its M.O.U. with the City. The City was provided with opportunities to cross-examine these witnesses. Opportunities for re-direct and re-cross examinations were also provided.

21. That a public comment portion of the hearing was held to allow other persons or entities not listed as parties to the formal hearing an opportunity to comment on the issues before the Chief Engineer, including the method by which surface water would be withdrawn from the Little Arkansas River, the process for treating and recharging water into the Equus Beds aquifer, the accounting system that the City will use to determine how much of the water has been recharged into the aquifer may be withdrawn; and if the applications are approved, any terms and conditions that would need to be placed on the permits in order to prevent impairment of

existing water rights and protect public interest.

22. That persons providing oral testimony in support of the project, during the public comment portion of the hearing, included Michael Gurman, The Boeing Company; Dennis Clennan, City of Hutchinson; John Waltner, Regional Economic Area Partnership (REAP) and City of Hesston; Bruce Seiler, landowner; Gerald Holman, Wichita Chamber of Commerce; Bob Nichols, Butler County Rural Water District No. 8; and that Mike McGinn, landowner; Ronald Neuway, landowner; and Joe Bergkamp, landowner, testified about concerns related to the proposed project.

23. That in addition to the oral testimony, the following provided written testimony in support of the project: The Boeing Company, the Wichita Independent Business Association, The Wichita Builders Association, John Waltner, Gerald H. Holman, the Wichita Area Chamber of Commerce, Chisolm Creek Utility Authority, the City of Goddard, the City of Colwich, Wesley Medical Center, and the City of Derby.

24. That both parties declined to present closing arguments.

25. That before closing the formal public hearing, the Chief Engineer directed the applicant to submit to the DWR: (a) a copy of the final M.O.U., between the City, and GMD #2, and (b) copies of easements or other legal rights of access to property on which the diversion wells and ASR wells are proposed to be located.

26. That on March 29, 2005, a final M.O.U., between the City and GMD #2, was filed in the Office of the Chief Engineer.

27. That the last of the final documents authorizing the City to have legal access to the property on which the wells are proposed to be located was received in the office of the Chief Engineer on June 28, 2005.

28. That the project involves four phases. Attachment 1 to this order is a map depicting the facilities proposed for all four phases of the project; that the applications referred to in Finding No. 17 all relate to Phase I of the project.

29. That the basin storage area for the proposed project is shown on Attachment 2 to this order. The basin storage area and 38 subareas, identified as index cells (cells), are also shown on Attachment 2 to this order. Each cell has an index well located as shown on Attachment 3 to this order; that the total amount of storage space in the basin storage area is estimated at this time to be approximately 200,000 acre-feet.

30. That the highest (January 1940 water level elevations) and lowest (January 1993 water level elevations) calculated index water level elevations for each of the index wells are set forth in a table in DWR Exhibit A; that GMD #2 recommended that the highest index water level elevations for index wells Nos. 2, 5 and 9, be changed to be 1427.5 feet mean sea level (msl), which is 22 feet below land surface (bls), 1425 feet msl (17.6 feet bls) and 1420 feet msl (11.6 feet bls), respectively; that the highest and lowest index water levels for each of the 38 cells are those set forth in Attachment 4 to this order; that GMD #2 recommended that water not be artificially recharged when the static water level exceeds the highest index water level to protect the public from the unreasonable raising of the water level.

31. That the City has developed a computer Accounting Model (Model) of an area larger than, and totally encompassing, the basin storage area. The Model is a MODFLOW model with three layers. The Model and the data sets used to operate the Model in transient mode were provided to the Chief Engineer on December 16, 2003, along with a general description of the model, its boundary conditions, calibration and sensitivity analyses and is described in DWR Exhibit O, and contained on a Compact Disc (CD) attached to this order as Attachment 5.

32. That on December 16, 2003, the City provided a description of the methodology which it proposes to use for accounting for recharge credits. Inputs to the Model for the accounting methodology include, but are not limited to, the metered amount of water artificially recharged by means of the ASR wells and the amount of water determined to have been recharged by means of any recharge basins or trenches (recharge credits in), the amount of recharge credits withdrawn, well pumpage data for all non-domestic wells in the project area, precipitation data and streamflow. The methodology will use the Model to determine water levels in the basin storage area for conditions of with and without artificial recharge. The Model will provide an accounting of the water that resides in each cell and the amount that moves between each cell and out of the basin storage area. The difference between the movement of water between cells and out of the basin storage area, with and without artificial recharge, gives the net movement of water between cells as a result of artificial recharge and this amount is deemed to be the movement of recharge credits between cells and any recharge credits which may exit the basin storage area. The Model will also calculate the recharge credit available in each cell. The City proposes to run the Model annually, during the March-April time period, to account for the previous calendar year's operations and to determine the recharge credit available to be withdrawn from each cell.

33. That the M.O.U. between the City and GMD #2 provides that there should be a review by GMD #2 and the Chief Engineer of all the data collected from the diversion well sites prior to the end of the first four years of operation; that after receiving comments from GMD #2, the Chief Engineer would, at a minimum, determine if: 1) the aquifer at the diversion wells is connected to the river, 2) the deep aquifer is connected to the shallow aquifer, and 3) the diversion wells are inducing river water into the aquifer at a rate sufficient to support the pumping of the diversion wells; that based on such review and findings, the Chief Engineer could require that the City modify the operation of the diversion well(s), or discontinue pumping from the diversion well(s), or continue the project; that the M.O.U. between the City and GMD #2 provides that at the end of four years of operation of the project, the City, in consultation with GMD #2, will re-evaluate the design and placement of recharge facilities near the Burrton contamination plume to determine if more effective plume control will be needed in the project.

34. That GMD #2, recommends that permits for diversion wells, pursuant to K.A.R. 5-22-17(a)(2), have a condition that requires that within seven days after the pumping of all diversion wells has ceased, the water level in each diversion well, or monitoring well located within 100 feet of the diversion well, will recover to an

elevation equal to or greater than the water level elevation immediately before the diversion well began to pump, adjusted for any regional groundwater level changes not caused by pumping of the diversion well; that GMD #2 recommends, pursuant to K.A.R. 5-22-17(a)(3), that a condition be placed on each permit that requires that the naturally occurring and artificially induced recharge from the bed and banks of the stream when bank storage is occurring will be sufficient to meet the following conditions: a) equal or exceed the authorized rate of diversion of all diversion wells, b) prevent impairment caused by all diversion wells, and c) prevent groundwater mining caused by all diversion wells; that GMD #2 recommends that a diversion well shall operate only during a bank storage event in the Little Arkansas River, as determined by measured river flow and evidence correlating the increase of river stage to the increase of water level in diversion wells or adjacent monitoring wells; that GMD #2 recommends requiring the applicant to: a) conduct an aquifer pump test to determine: i) the diversion wells' capture zones, and ii) the hydraulic connection between the aquifer's upper and lower zones at the diversion wells, and b) to submit said data and test results to the Chief Engineer within a specified time.

35. That GMD #2 has recommended that: (a) a monitoring well network should be established using Kansas Geological Survey (K.G.S.) methodology to determine index water levels in each cell, and monitoring water levels for water balance calculations and determination of recharge credits, (b) that as determined by Kansas Geological Survey methodology the basin storage area should be divided into 38 cells and each cell assigned an index identification number as shown on Attachment 2 to this order; (c) the monitoring of hydrologic conditions in the basin storage area shall include water levels, water quality, water use, water storage, water recovery, precipitation, basic data access and operational reports; (d) that prior to the use of the ASR well, the City should submit a water level and water quality measurement plan to the GMD #2 and the Chief Engineer, (e) that the water level monitoring at the aquifer storage and recovery well should be automated with a measurement frequency of not to exceed six hours, (f) that the water quality measurement plan shall include all necessary chemical, physical, radiological, and biological data, including, but not limited to, continuous monitoring of specific conductance, pH, turbidity, dissolved oxygen, and temperature, and (g) that the monitoring of hydrologic conditions in the bank storage and basin storage areas shall include water levels, water quality, water use, water storage, water recovery, precipitation, basic data access and operational reports.

36. That a description of a network of monitoring wells for the project, proposed by GMD #2, was submitted at the hearing.

37. That GMD #2 has recommended that stream flow data collected from the U.S. Geological Survey, Stream Gage No. 07143672 (Gage), located on the Little Arkansas River at Highway 50, near Halstead, Kansas, or an equivalent gage, as approved by the Chief Engineer in the event the gage should be relocated or discontinued, shall be used to determine stream flow conditions and shall be adjusted for intervening base flow nodes and existing surface water rights to determine under what conditions a diversion well may be operated; that the diversion wells shall be operated only when the streamflow at the Gage exceeds

baseflow and will not cause the streamflow at the Gage to drop below baseflow; that baseflow is defined as flows in the Little Arkansas River equal to or less than 57 cubic feet per second (c.f.s.) during the months of April 1, through September 30, and equal to or less than 20 c.f.s., at the Gage during the months from October 1, through March 31.

38. That Phase I of the project proposes to begin the development of a hydraulic barrier to prevent the migration of a brine plume, currently located in the vicinity of Burrton, Kansas, into the area where the City's existing Equus Beds well field and other water rights are located; that the wells proposed under Application File Nos. 45,567, 45,568, 45,576 and 46,081 are intended to be used, in part, to raise the water level in the aquifer in the area just east of the brine plume through the injection of source water diverted by means of the diversion wells; that the raising of the water level in the aquifer will alter the existing gradient such that the movement of the brine plume will be restricted from encroachment into the City's well field.

39. Evidence was presented at the hearing that indicates that this project would be in the public interest because it will:

    a. Make the City's long term water supply more reliable;

    b. Benefit the City and other water users in the area by delaying or stopping the Burrton salt water plume from entering the area and contaminating this fresh water source of supply; and

    c. Raise the water level in general which in turn reduces the pumping head saving water users in the area energy and money.

40. That GMD #2 recommended approval of Application, File No. 45,567, as amended, subject to certain conditions; that the spacing between the well proposed under Application, File No. 45,567, and the authorized location for the well under Appropriation of Water, File No. 41,812 is about 1095 feet; that this spacing is less than that required by K.A.R. 5-22-2(a), which is 1,320 feet; that GMD #2 recommended that except for normal maintenance the well authorized under File No. 45,567 shall not be used for diversion of water during the period June 1 through September 30 each year; that Appropriation of Water, File No. 41,812 authorizes a maximum annual quantity of 198 acre-feet to be pumped at a maximum rate not to exceed 900 gallons per minute for the irrigation of 132 acres in the Southwest Quarter (SW¼) of Section 24, Township 23 South, Range 3 West, Harvey County, Kansas; that one of the owners of this water appropriation (the one who owns 105 of the 132 acres of the authorized place of use), is also the owner of the land on which the well proposed under Application, File No. 45,567, is to be located, signed an agreement for permanent easement with the City for the land on which the well proposed under Application, File No. 45,567 is to be located.

41. That GMD #2 recommended approval of Application, File No. 46, 081, subject to certain conditions; that the spacing between the well proposed under Application, File No. 46, 081, and the authorized location for the well under Water Right, File No.

32, 597, is about 830 feet; that this spacing is less than that required by K.A.R. 5-22-2(a), which is 1,320 feet; that GMD #2's recommendation was silent concerning the well spacing; that Water Right, File No. 32,597 authorizes a maximum annual quantity of 153 acre-feet to be pumped at a maximum rate not to exceed 575 gallons per minute for the irrigation of 157 acres in the Northwest Quarter (NW 1/4) of Section 36, Township 23 South, Range 3 West, Harvey County, Kansas; that the owner of this water right, who is also the owner of the land on which the well proposed under Application, File No. 46,081 is to be located, signed an agreement for permanent easement with the City for the land on which the well proposed under Application, File No. 46,081 is to be located; that except for periodic maintenance, the well proposed under Application, File No. 46,081 is primarily to be used to recharge the aquifer.

42. The final amended M.O.U. between the City and GMD #2 did not contain an agreement or recommendation concerning the City's request for passive recharge credits (credits for not pumping City wells in the basin storage area) and deferred the matter to the Chief Engineer.

43. That, in accordance with the M.O.U., GMD #2 recommended approval of the City's new Applications to Appropriate Water, File Nos. 45,567; 45,568; 45,569, as modified; 45,570; 45,571; 45,572, as modified; 45,573; 45,574; 45,575; 45,576, as modified; and 46,081, subject to various conditions GMD#2 set out in its recommendations.

44. That GMD #2 recommended that the use of the proposed ASR wells be authorized by the Kansas Department of Health and Environment (KDHE) as Class V Underground Injection Control (UIC) wells and that minimum water quality standards for effluent be approved by KDHE for organic and inorganic compounds, pesticides and bacteria; that the water recharged into the aquifer through the ASR wells comply with the source water definition in K.A.R. 5-1-1.

45. That GMD #2 recommended that the water recharged into the aquifer either comply with the U. S. Environmental Protection Agency (EPA) and KDHE safe drinking water standards, or meet the ambient water use at the recharge site, whichever is better, as determined by the Secretary of KDHE; and that the quality of recharge water injected into the aquifer through the ASR wells not degrade the ambient groundwater use in the basin storage area.

46. That as agreed in the M.O.U., GMD #2 recommended that each diversion well should have a maximum pumping rate not to exceed 1000 gallons per minute and that the City should submit a well field operation, monitoring and reporting plan for review and comment by GMD #2 and approval by the Chief Engineer.

47. That GMD #2 recommended that each diversion well should be equipped with a water meter pursuant to K.A.R. 5-22-4(a). That GMD#2 recommended that each ASR well be equipped with water meters to separately and accurately record the total flow of water injected and diverted from the ASR well and that the water meter installations comply with K.A.R. 5-22-4.

48. That GMD #2 recommended that bank storage diversion quantities, aquifer injection quantities, water level data and water quality analysis be reported by the City to the Chief Engineer and GMD #2 as follows:

    a. Each month for the first year of operation.
    b. Each calendar quarter for the second year of operation.
    c. By March 1 of each calendar year thereafter.

49. That the applications for the diversion wells and the ASR wells are not subject to the GMD #2 safe yield requirements as set forth in K.A.R. 5-22-7(b)(6) and (7).

50. That K.A.R. 5-12-2 requires that the permit holder of an aquifer storage and recovery system shall by June 1 each year report an accounting of water in the basin storage area to the Chief Engineer and to GMD #2; that the annual report for the preceding calendar year shall account for all water entering and leaving the basin storage area and shall specifically compute the amount of recharge credits held in each cell in the basin storage area.

51. That GMD #2 recommends that the City of Wichita simultaneously submit to the Chief Engineer and GMD #2 a final report containing a description and scaled map of the as-built aquifer storage and recovery project.

Conclusions

Based on the foregoing Findings and under authority of the Kansas Water Appropriation Act, K.S.A. 82a-701 *et seq*., in particular, K.S.A. 82a-706, K.S.A. 2004 Supp. 82a-711 and K.S.A. 82a-711a, and in consideration of the M.O.U. between the City and GMD #2, as modified, the recommendation of GMD #2, and the record of this matter, the Chief Engineer hereby concludes that:

1. That the City has legal access to the sites where the proposed wells will be located as required by K.A.R. 5-3-3a, as demonstrated by the agreements submitted to the Chief Engineer prior to the issuance of this order.

2. That the City's new Applications to Appropriate Water, File Nos. 45,567; 45,568; 45,569, as modified; 45,570; 45,571; 45,572, as modified; 45,573; 45,574; 45,575; 45,576, as modified; and 46,081, will not impair an existing use nor prejudicially and unreasonably affect the public interest if they are operated in accordance with the terms, conditions, and limitations set forth in this order and on the permits attached hereto; have been filed in good faith; are in proper form; contemplate use of water for a beneficial purpose; meet all other statutory and regulatory criteria for approval; and therefore should be approved.

3. That passive recharge credits should not be allowed because they are not “artificial recharge” as defined in K.A.R. 5-1-1, because no source water is being artificially recharged to create those credits.

4. That no evidence has been submitted to suggest that the proposed project will impair existing water rights by causing an unreasonable deterioration of the water quality at any water user's point of diversion beyond a reasonable economic limit, if they are operated in accordance with the terms, conditions, and limitations set forth in the order and on the permits attached hereto.

5. That continued full scale testing and modeling is necessary to confirm that the water diverted from the proposed diversion wells is actually water absorbed by and temporarily stored in the bed and banks of the Little Arkansas River during above-baseflow stage and to ensure that only bank storage water is being withdrawn.

6. That the conditions agreed to in the M.O.U., between the City and the GMD #2, should adequately protect landowners in the area being recharged from damage from the unreasonable raising of the water table.

7. That the terms, conditions, and limitations of the permits, as recommended by GMD #2, and as approved by the Chief Engineer, should protect downstream water users in the Little Arkansas River against impairment caused by diversion of high flows of the river.

8. That there is no evidence to suggest that the approval of the applications would impair senior water rights in the Equus Beds Aquifer by adversely affecting the underflow, if they are operated in accordance with the terms, conditions, and limitations set forth in this order and on the permits attached hereto.

9. That the aquifer storage and recovery project meets the requirements of all pertinent regulations, including K.A.R. 5-1-1, K.A.R. 5-12-1 through K.A.R. 5-12-4, and K.A.R. 5-22-1, K.A.R. 5-22-10, and K.A.R. 5-22-17.

10. That applications for diversion wells and aquifer storage and recovery wells are not subject to GMD #2 safe yield requirements as provided in K.A.R. 5-22-7(b)(6) and (7).

11. That the basin storage area for the project should be approved as set forth in Attachment 2 to this order.

12. That the index well locations and the index water levels for the basin storage area as set forth in Attachments 3 and 4 to this order should be approved; that the total amount of storage available in the basin storage area is currently estimated to be 200,000 acre-feet; that the horizontal description of the basin storage area, its subdivision into 38 cells, the vertical extent of the basin storage area defined by highest and lowest index water elevations in each cell, meets the requirements of K.A.R. 5-12-1(b); and should be approved.

13. That if the project is operated so that recharge credits cannot be withdrawn if the static water level in the index well is below the lowest index water level for that index well, the public interest in not diverting Equus Beds groundwater will be protected.

14. That if the project is operated such that when index water level measurements and water levels predicted by the Model for the index wells are at or below the highest index water levels at any time source water is recharged into the basin storage area by the use of the wells proposed under Application File Nos. 45,567, 45,568, 45576 and 46,081, the public interest will be protected by preventing water levels in the basin storage area from rising too high.

15. That if the wells proposed under Application File Nos. 45,567, 45,568, 45,576, and 46,081, are prevented from recharging water when the water level in any required monitoring well located within 660 feet of the recharge and recovery well is less than 10 feet below the land surface, the public interest will be protected from water levels being raised too high by the project.

16. That the accounting methodology and the use of the Model developed by the City for the project are sufficient to be able to account for available recharge credits in the basin storage area; that the methodology uses sound engineering methods based on actual measurements and generally accepted engineering methodology; that as additional data are collected and used in the Model, the Model should be able to better account for available recharge credits in the basin storage area; that if new or better methods of accounting should be developed in the future, provision should be made in this order for the use of those methods if it can be demonstrated to the Chief Engineer and GMD #2 that they improve the accounting of available recharge credits in the basin storage area; and that the Model and the accounting methodology are sufficient to allow the City to comply with K.A.R. 5-12-2(a) and (b); and should be approved.

17. That the review of the project after four years of operation that was recommended by GMD #2 should be required.

18. That the monitoring well network, as shown on Attachments 17 through 21, and the water level monitoring, described in Findings 35 and 36, should be approved.

19. That if the operation of the diversion wells is restricted such that they are operated only when streamflow at the Gage exceeds baseflow and will not cause the streamflow, as measured at the gage, to fall below baseflow, senior water rights will not be impaired; and that for the purpose of this project the baseflow is 57 c.f.s., from April 1, through September 30; and 20 c.f.s., from October 1, through March 31.

20. That the City should conduct an aquifer pump test, and any other necessary hydraulic tests, at each proposed diversion well site to determine whether each well will meet the requirements of K.A.R. 5-22-17.

21. That the wells authorized by File Nos. 45,567 and 45,568 should only withdraw

available recharge credits from Cell No. 5; that the well authorized by File No. 45,576 should only withdraw available recharge credits from Cell No. 2; that the well authorized by File No. 46,081 should only withdraw available recharge credits from Cell No. 9.

22. That each diversion well and ASR well should be equipped with water flowmeters that meet the requirements of K.A.R. 5-22-4 to separately and accurately record the total quantity of water injected into, and diverted by, each well.

23. That each recharge basin should be instrumented in such a manner as to determine the total quantity of water recharged into the aquifer at the recharge basin.

24. That if Application, File No. 45,567 is approved with an additional condition that, except for normal maintenance, the well authorized under that file number will not be used for diversion of water during the period June 1 through September 30 each year, its operation will not impair Appropriation of Water, File No. 41,812.

25. That if Application, File No. 46,081 is approved with an additional condition that except for normal maintenance the well authorized under that file number will not be used for diversion of water during the period June 1 through September 30 each year, its operation will not impair Water Right, File No. 32,597.

26. That this project is in the public interest because it will:

    a. Make the City's long term water supply more reliable;
    b. Benefit the City and other water users in the area by delaying or stopping the Burrton salt water plume from entering the area and contaminating this fresh water source of supply; and
    c. Raise the water level in general which in turn reduces the pumping head saving water users in the area energy and money.

27. That bank storage diversion quantities, aquifer injection quantities and water level data should be reported by the City to the Chief Engineer and GMD#2 as follows:

    a. Each month for the first year of operation;
    b. Each calendar quarter for the second year of operation;
    c. By March 1 each year thereafter;
    d. Other intervals as may be required by the Chief Engineer to properly evaluate the project;

    That any water quality analyses which may be required by KDHE should be reported by the City to the Chief Engineer and GMD #2 at the same time they are reported to KDHE.

28. That based on the annual accounting report and the recommendation of GMD #2, the Chief Engineer should annually determine the recharge credits available to the City.

29. That the City should file an annual accounting report that meets the requirements

of K.A.R. 5-12-2.

30. That the City should submit a well field operation and monitoring plan for the diversion wells for review and comment by GMD #2 and approval of the Chief Engineer, no later than the test results required in Order condition No. 13.

31. That each bank storage well should have a maximum diversion rate not in excess of 1000 g.p.m.

32. That the City should simultaneously submit to the Chief Engineer and GMD #2 a formal report containing a description and scaled map of the as-built aquifer storage and recovery project.

Order

NOW, THEREFORE, the following are the decisions of the Chief Engineer:

1. That the City's applications for approval to appropriate water for beneficial use, under File Nos. 45,567; 45,568; 45,569; 45,570; 45,571; 45,572; 45,573; 45,574; 45,575; 45,576 and 46,081, shall be and are hereby approved, as set out in Attachments 6 through 16, which are hereby made part of this Initial Order.

2. That passive recharge credits shall not be allowed.

3. That the basin storage area and index cells for the project are as set forth in Attachment 2 to this order.

4. That the locations of the index wells and the index water levels for the basin storage area shall be as set forth in Attachments 3 and 4 to this order.

5. That the Model and accounting methodology is approved as submitted, until otherwise modified by formal written approval of the Chief Engineer.

6. That if the City develops an improved model or methodology to account for water stored in the basin storage area that is approved by the Chief Engineer after consideration of the recommendation of the GMD #2, that the Chief Engineer may approve such improved methodology without the necessity of holding additional public hearings.

7. That the project shall be operated so that the measured water levels, and the water levels predicted by the Model, stay at or below the highest index water level any time water is being recharged into the basin storage area.

8. That water shall only be injected into the basin storage area by means of the injection wells when the water level at any required monitoring well located within

660 feet of an injection well is 10 feet or more below the land surface elevation at those observation wells; that recharge credits may be withdrawn from a cell only when recharge credits are available from the cell and the static water level at its index well is above the lowest index level; however, water may be recharged when the static water level is below the lowest index level in that well.

9. That the City by June 1 each year shall report an accounting of water diverted from diversion wells and recharged into the basin storage area in the Equus Beds Aquifer; that the Report shall be submitted to the Chief Engineer and GMD #2. The accounting shall use the Model and the accounting methodology described herein. In addition, the accounting reports shall meet the requirements of K.A.R. 5-12-2, including specifically addressing the following items for each cell in the basin storage area:

    a. Natural and artificial recharge;
    b. Groundwater inflow and outflow;
    c. Evaporation and transpiration;
    d. Groundwater water diversions from all non-domestic wells;
    e. Infiltration from streams;
    f. Groundwater discharge to streams; and
    g. The calculated recharge credits.

10. That the final determination of available recharge credits in each cell in the basin storage area shall be made by the Chief Engineer, upon consideration of the report required in Paragraph No. 9, above, and any recommendation by GMD #2. The

Chief Engineer shall make the final determination in writing.

11. That withdrawal of any recharge credits by means of the wells authorized under the approvals of application, File Nos. 45,567, 45, 568, 45,576 and 46,081, in addition to the maximum annual quantities specifically set forth in those approvals, shall be limited to the available recharge credits determined by the accounting methodology as follows:

    a. The wells authorized by File No. 45,567 and 45,568 shall only withdraw available recharge credits from Cell No. 5.

    b. The well authorized by File No. 45,576 shall only withdraw available recharge credits from Cell No. 2.

    c. The well authorized by File No. 46,081 shall only withdraw available recharge credits from Cell No. 9.

12. That the diversion wells shall be operated only when streamflow at the Gage exceeds baseflow and will not cause streamflow to drop below baseflow; that for the purpose of this project the baseflow is 57 c.f.s., from April 1, through September 30; and 20 c.f.s., from October 1, through March 31, as measured at the Gage.

13. That upon completion of each diversion well, the City shall operate it for a reasonable period of time, not to exceed a total of 90 days of pumping, or within any authorized extension of time, to collect data, and conduct any necessary hydraulic tests, including an aquifer pump test, at each proposed diversion well site to determine whether each well will meet the requirements of K.A.R. 5-22-17; that within 90 days of completion of the test or tests on each well, or within any authorized extension of time, the City shall submit a report to the Chief Engineer and the District demonstrating whether or not each diversion well meets the requirements of K.A.R. 5-22-17; and that the Chief Engineer will then determine, based on consideration of the report and the recommendation of GMD #2, whether operation of that well may continue and if so, under what conditions.

14. That each diversion well and ASR well shall be equipped with water flow meters, meeting the requirements of K.A.R. 5-22-4, to separately and accurately record the total quantity of water injected into and diverted by each well.

15. That each recharge basin shall be sufficiently instrumented to determine the amount of water recharged into the aquifer; that before any source water is diverted into the recharge basin, the City shall describe the instrumentation and any calculations that will be used to determine the quantity of water recharged to the aquifer; that no recharge credits shall accrue until the instrumentation and calculations are approved by the Chief Engineer.

16. That the source water used for artificial recharge shall not degrade the ambient groundwater quality use in the basin storage area; that the monitoring well network shown in Attachments 17 through 21 of this order and the water level monitoring plan recommended by GMD #2 is hereby approved; that the monitoring wells shall

be drilled and completed at depths correlating to the upper and lower zones of the aquifer in the monitoring wells for the diversion wells and in the recharge and recovery zone of the aquifer for the ASR wells and recharge basins for water sample collection, water level measurements and testing purposes; that the water level monitoring at any ASR well site shall be automated with a frequency not to exceed six hours; that before installation of any ASR well, the City shall submit a plan that includes water level monitoring as well as water quality monitoring, which is sufficient to prevent impairment of the water quality beyond a reasonable economic limit, to GMD #2 for review and comment and the Chief Engineer for approval; that the plan should also be consistent with any requirement which KDHE may impose for any UIC permits KDHE may issue pertaining to the ASR wells, the recharge well and the recharge basins.

17. That the City shall submit a well field operation, monitoring and reporting plan for the diversion wells for review and comment by GMD #2 and approval of the Chief Engineer, no later than the date the test results in Order Paragraph No. 13 are required; that the operational plan shall include utilization of monitoring wells and the streamflow Gage in an automated system.

18. That Application, File No. 45,567, shall include an additional condition that, except for normal maintenance, the well authorized under said file number will not be used for diversion of water during the period June 1 through September 30 each year.

19. That Application, File No. 46,081, shall include an additional condition that, except for normal maintenance, the well shall not be used for diversion of water during the period June 1 through September 30 each year.

20. That bank storage diversion quantities, aquifer injection quantities and water level data shall be reported by the City to the Chief Engineer and GMD #2 as follows:

    a. Each month for the first year of operation;
    b. Each calendar quarter for the second year of operation;
    c. By March 1 each year thereafter;
    d. Other intervals as may be required by the Chief Engineer to properly evaluate the project;

    That any water quality analyses, which may be required by KDHE, shall be reported by the City to the Chief Engineer and GMD #2 at the same time they are reported to KDHE.

21. That on or before June 1, of each calendar year, the City shall submit to the Chief Engineer and GMD #2, an annual accounting report for water in the basin storage area, utilizing the Model; that shall meet the requirements of K.A.R. 5-12-2.

22. That the City of Wichita shall simultaneously submit to the Chief Engineer and GMD #2 a formal report containing a description and scaled map of the as-built aquifer storage and recovery project.

23. That the Chief Engineer also retains jurisdiction in this matter so that during 2009, GMD #2 can review all data from the Little Arkansas River, the alluvium and Equus Beds Aquifer, diversion records from the diversion wells, injection and diversion data from the ASR wells, water quality information, streamflow data, water level data, and

all other data relevant to the evaluation of this aquifer storage and recharge project, to determine the following:

a. Whether the portion of the aquifer in which the diversion wells are screened is hydraulically connected to the Little Arkansas River;

b. Whether the portion of the aquifer where the diversion wells are screened is hydraulically connected to the upper part of the aquifer;

c. Whether the naturally occurring and artificially induced recharge from the bed and banks of the stream when bank storage was occurring has been sufficient to:

    1. Equal or exceed the authorized rate of diversion of all diversion wells,

    2. Prevent impairment by all diversion wells, and

    3. Prevent groundwater mining from being caused by all diversion wells;

d. Whether seven days after pumping of all diversion wells has ceased, the water level in each diversion well, or monitoring well located within 100 feet of the diversion well, has recovered to an elevation equal to or greater than the water level elevation immediately before the diversion well began to pump, adjusted for any regional groundwater changes not caused by the pumping of diversion wells;

e. Whether the wells have been only operated during bank storage events;

f. The effect of the recharge on the water quality and water levels in the Equus Beds Aquifer in the basin storage area; and

g. Whether the ASR project has delayed or stopped the migration of the Burrton brine plume into the basin storage area;

Based on the data and the GMD #2 review and recommendation, the Chief Engineer shall determine if the City may continue to operate the ASR project, be required to stop the ASR project in its entirety, be required to modify the project; and whether any of these permits should be revoked or modified.

24. That the Chief Engineer also specifically retains jurisdiction in this matter with authority to make such reasonable reductions in the approved rate of diversion and quantity authorized to be perfected, and such changes in other terms, conditions, and limitations set forth in this approval and permit to proceed as may be deemed necessary to protect the public interest.

Petition for Review

Pursuant to K.S.A. 2004 Supp. 82a-711 and K.S.A. 2004 Supp. 82a-1901(a), if aggrieved by this Initial Order, the applicant may petition for administrative review in accordance with the provisions of the Kansas Administrative Procedure Act, K.S.A. 82a-77-501 et seq. The petition must be filed within 15 days after the date of service of this Initial Order and must set forth the basis for review. The petition for administrative review shall be in writing and shall be submitted to:

Adrian Polansky, Secretary of Agriculture
Kansas Department of Agriculture
109 SW 9th Street, 4th Floor
Topeka, Kansas 66612
Fax: (785) 368-6668

Effective Date of Order; Final Agency Action

Unless a later date is stated herein, this Initial Order shall become effective and shall become a final agency action, as defined in K.S.A. 77-607(b), without further notice to the parties, if a petition for administrative review has been filed, as set forth herein, and the Secretary has issued an order stating that review will not be exercised. If no party has filed a petition for administrative review by the Secretary and the Secretary has not given written notice of intention to exercise review, this Initial Order shall become effective and shall become a final agency action thirty (30) days after its service. K.S.A. 77-530.

Dated at Topeka, Kansas, this day of , 2005.

_____

David L. Pope, P.E.
Chief Engineer
Division of Water Resources
Kansas Department of Agriculture

State of Kansas)
) SS
County of Shawnee)

The foregoing instrument was acknowledged before me this 8th day of August, 2005, by David L. Pope, P.E., Chief Engineer, Division of Water Resources, Kansas Department of Agriculture.

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Notary Public

List of Attachments to Order

1. Map of Project
2. Map of Basin Storage Area and 38 subareas
3. Index Well Map
4. High and Low Index Water Levels in Each Cell
5. Model CD
6. Approval of Application and Permit to Proceed, File No. 45,567
7. Approval of Application and Permit to Proceed, File No. 45,568
8. Approval of Application and Permit to Proceed, File No. 45,569
9. Approval of Application and Permit to Proceed, File No. 45,570
10. Approval of Application and Permit to Proceed, File No. 45,571
11. Approval of Application and Permit to Proceed, File No. 45,572
12. Approval of Application and Permit to Proceed, File No. 45,573
13. Approval of Application and Permit to Proceed, File No. 45,574
14. Approval of Application and Permit to Proceed, File No. 45,575
15. Approval of Application and Permit to Proceed, File No. 45,576
16. Approval of Application and Permit to Proceed, File No. 46,081
17. Bank Storage Groundwater Monitoring Well Site Map
18. Monitoring Well Network, File No. 45,567
19. Monitoring Well Network, File No. 45,568
20. Monitoring Well Network, File No. 45,569
21. Monitoring Well Network, File No. 46,081